# URANIUM AND ITS DECAY PRODUCTS IN RADIOACTIVE ANOMALIES OF OXIDIZED BROWN COALS (WESTERN PART OF KANSKO-ACHINSK BROWN COAL BASIN)

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Jurassic brown coals of the Kansk-Achinsk coal basin (Jurassic depositions of the southern edge of the Western-Siberian plate and the Siberian platform) are the actual source of combustible for thermal power stations and for house use by local population of the Western Siberia. The thick (up to 70 m) coal layers lay almost horizontally. From above they are recoated by thin layer of quarternary sediments. Coal deposits here are very convenient for an open-cut mining. Typical run-of-mine (unaltered) coals are characterised by low trace elements content and has, correspondingly, a low radioactivity. According to literary data average contents of uranium in unaltered coals for various deposits of the western part of the Kansko-Achinsk basin vary from 1 up to 11 ppm (12-140 Bq/kg). Ash content of such coals is 6-16%. Usually the upper part of the coal layers directly under quarternary sediments is oxidized. The uppermost horizons of coal (0.5-1.5 m) are most oxidated because they are situated in waterbearing formation. They often become friable and have sooty structure. Ash content increases here up to 25-35%. Oxidized and especially “sooty” coals are often strongly enriched by uranium and its decay products. Uranium content in “sooty” coals can reach 2100 ppm (26000 Bq/kg).

The radioactive anomalies connected with oxidized ("sooty") coals localized in some brown coal deposits of the western part of the Kansko-Achinsk coal basin are studied in this work. Several types of radioactive anomalies are differed by the ratio of activities of $^{238}U$ and $^{226}Ra$: 1) Equilibrium; 2) Radium; 3) Uranium. Anomalies of the first type are characterised by presence of the radioactive equilibrium between $^{238}U$ and $^{226}Ra$. This is evidence of absence of any significant geochemical processes leading to separation of U and its decay products. For second type anomalies a considerable excess of Ra is observed. Here we can say about presence of some geochemical processes leading to a removal of U already after accumulation of its decay products. In anomalies of the third type U prevails over its daughter products. Here we can say about the fact of rather late transfer of U with its accumulation relative to Ra. In many studied anomalies disequilibrium caused by natural Rn emanation in coals was observed. It was fixed by depletion of $^{210}Pb$ resulted from migration of its predecessor - heavy $^{222}Rn$ depthward outside the U-Ra anomaly, while U and Ra remained in equilibrium. The being within waterbearing formations may enable uranium and its decay products to be involved in aqueous migration. That can result in deterioration of a radioecological situation in nearby settlements.